CLAIMS

1. **(Previously Presented)** A field grading material comprising:

a polymer matrix, said polymer matrix having one or more polymer phases; and

a field grading effective amount of a nanoparticle filler, said filler is: heterogeneously distributed in said polymer matrix such that said nanoparticle filler is well dispersed in at least part of one of said polymer phases; and said filler comprises less than 40% by volume of said field grading material.

2. **(Previously Presented)** A field grading material according to claim 1, wherein said nanoparticle filler is selected from semiconducting materials having an energy bandgap ranging from 0 eV to 5 eV and dielectric materials having a bulk dielectric constant at infinitely high frequencies of at least 5.

3. **(Previously Presented)** A field grading material according to claim 1, wherein said nanoparticle filler comprises a semiconducting material.

4. **(Previously Presented)** A field grading material according to claim 1, wherein said nanoparticle filler is selected from ZnO, SnO, InO, CeO, TiO_2, SiC, $BaTiO_3$, Al_2O_3, SiO_2 and mixtures thereof.

5. **(Previously Presented)** A field grading material according to claim 1, wherein said polymeric matrix comprises a rubber, a thermoplastic polymer, a thermosetting polymer, or thermoplastic elastomer.

6. **(Previously Presented)** A field grading material according to claim 5, wherein said polymeric matrix comprises at least one of a polyolefin rubber, a thermoplastic polyolefin elastomer, a silicone rubber, and a crystalline thermoplastic polymer.

7. **(Previously Presented)** A field grading material according to claim 5, wherein said polymeric matrix comprises a polymer selected from EPDM and polyethylene.

8. **(Previously Presented)** A field grading material according to claim 1, wherein said polymeric matrix comprises a polymer blend of immiscible polymers.

9. **(Previously Presented)** A field grading material according to claim 8, wherein said polymer blend is selected from polyethylene/EPDM, LDPE/HDPE, and maleic anhydride-modified EPDM/EPDM.

10. **(Previously Presented)** A field grading material according to claim 1, wherein said nanoparticles have a particle size in at least one of a range from 2 to 80 nm, from 5 to 50 nm, and from 5 to 30 nm.

11. **(Previously Presented)** A field grading material according to claim 1, wherein said nanoparticle filler comprises less than 40% by volume of the field grading material, less than 30% by volume of the field grading material, or less than 20% by volume of the field grading material.

12. **(Previously Presented)** A field grading material according to claim 1, wherein a surface of said nanoparticle filler is modified by treatment with a organosilane or organotitanate compound and the organosilane compound comprises an organic group selected from alkyl, alkylamino, amino and carboxy.

13. **(Previously Presented)** A field grading material according to claim 12, wherein said organic group is selected from methyl, decyl, octyl, vinyl, aminopropyl and acetoxy.

14. **(Previously Presented)** A field grading material comprising a nanoparticle filler distributed in a polymeric matrix, wherein a surface of said nanoparticle filler is modified by treatment with an organosilane or organotitanate compound and said organosilane compound comprises an organic group selected from alkyl, alkylamino, amino and carboxy.

15. **(Previously Presented)** A field grading material according to claim 14, wherein said organic group is selected from methyl, decyl, octyl, vinyl, aminopropyl, and acetoxy.

16. **(Previously Presented)** A field grading material comprising a carbon nanotube filler

distributed in a polymeric matrix, wherein said filler is heterogeneously distributed in said polymeric matrix and said polymeric matrix comprises a rubber, a thermoplastic polymer, a thermosetting polymer, thermoplastic elastomer, or a crystalline thermoplastic polymer.

17. **(Previously Presented)** A field grading material according to claim 16, wherein said polymeric matrix comprises a polymer selected from EPDM and polyethylene.

18. **(Previously Presented)** A method for reducing electric field stress at a joint or termination of an electric cable, said method comprising introducing in said joint or termination a field grading material according to claim 1.

19. **(Previously Presented)** An insulating material comprising an insulating effective amount of a nanoparticle filler distributed in a polymeric matrix, wherein said nanoparticle filler is heterogeneously distributed in said polymeric matrix.

20. **(Previously Presented)** An insulating material according to claim 19, wherein said nanoparticle filler is selected from semiconducting materials having an energy bandgap ranging from 0 eV to 5 eV and dielectric materials having a bulk dielectric constant at infinitely high frequencies of at least 5.

21. **(Previously Presented)** An insulating material according to claim 19, wherein said nanoparticle filler comprises a semiconducting material.

21. **(Previously Presented)** An insulating material according to claim 19, wherein said nanoparticle filler is selected from ZnO, SnO, InO, CeO, TiO_2, SiC. $BaTiO_3$, Al_2O_3, SiO_2 and mixtures thereof.

23. **(Previously Presented)** An insulating material according to claim 19, wherein said polymeric matrix comprises a rubber, a thermoplastic polymer, a thermosetting polymer, or thermoplastic elastomer.

24. **(Previously Presented)** An insulating material according to claim 23, wherein said

polymeric matrix comprises at least one of a polyolefin rubber, a thermoplastic polyolefin elastomer, a silicone rubber, and a crystalline thermoplastic polymer.

25. **(Previously Presented)** An insulating material according to claim 23, wherein said polymeric matrix comprises a polymer selected from EPDM and polyethylene.

26. **(Previously Presented)** An insulating material according to claim 19, wherein said polymeric matrix comprises a polymer blend of immiscible polymers.

27. **(Previously Presented)** An insulating material according to claim 26, wherein said polymer blend is selected from polyethylene/EPDM, LDPE/HDPE, and maleic anhydride-modified EPDM/EPDM.

28. **(Previously Presented)** An insulating material according to claim 19, wherein said nanoparticles have a particle size in at least one of a range from 2 to 80 nm, from 5 to 50 nm, and from 5 to 30 nm.

29. **(Previously Presented)** An insulating material according to claim 19, wherein said nanoparticle filler comprises less than 20% by volume of the insulating material, less than 10% by volume of the insulating material, or less than 5% by volume of the insulating material.

30. **(Previously Presented)** An insulating material according to claim 19, wherein a surface of said nanoparticle filler is modified by treatment with an organosilane or organotitanate compound and said organosilane compound comprises an organic group selected from alkyl, alkylamino, amino and carboxy.

31. **(Previously Presented)** An insulating material according to claim 30, wherein said organic group is selected from methyl, decyl, octyl, vinyl, aminopropyl and acetoxy.

32. **(Previously Presented)** An insulating material comprising a nanoparticle filler distributed in a polymeric matrix, wherein a surface of said nanoparticle filler is modified by treatment with an organosilane or organotitanate compound and said organosilane compound comprises an organic

group selected from alkyl, alkylamino, amino and carboxy.

33. **(Original)** An insulating material according to claim 32, wherein the organic group is selected from methyl, decyl, octyl, vinyl, aminopropyl and acetoxy.

34. **(Previously Presented)** An insulating material comprising a carbon nanotube filler distributed in a polymeric matrix, wherein said filler is heterogeneously distributed in said polymeric matrix and said polymeric matrix comprises a rubber, a thermoplastic polymer, a thermosetting polymer, thermoplastic elastomer or a crystalline thermoplastic polymer.

35. **(Previously Presented)** An insulating material according to claim 34 wherein a polymeric matrix comprises a polymer selected from EPDM and polyethylene.

36. **(Previously Presented)** A process for manufacturing a field grading material, said process comprising:

mixing a nanoparticle filler with at least one polymer to form a mixture, wherein said polymer is in a particulate form, said polymer particulates being at least 10 times greater in size than said nanoparticle filler, and said polymer comprises a rubber, a thermoplastic polymer, a thermosetting polymer, or a thermoplastic elastomer; and

heating said mixture to form said field grading material.

37. **(Previously Presented)** A process according to claim 36, wherein said at least one polymer comprises a mixture of immiscible polymers.

38. **(Previously Presented)** A process according to claim 36, wherein said polymer is selected from a group consisting of polyolefin rubber, a thermoplastic polyolefin elastomer, a silicon rubber, and a crystalline thermoplastic polymer.

39. **(Previously Presented)** A process according to claim 36, wherein said polymer is selected from EPDM and polyethylene.

40. **(Previously Presented)** A process according to claim 36, wherein said polymer particulates are at least 100 times greater in size than the nanoparticle filler.

41. **(Previously Presented)** A process according to claim 36, wherein said polymer particulates are at least 1000 time greater in size than the nanoparticle filler.

42. **(Previously Presented)** A process according to claim 36, wherein said nanoparticle filler is semiconducting carbon nanotubes.